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=> s kulbe, ?/au  
L1 962 KULBE, ?/AU

=> s l1 and cofactor  
L2 38 L1 AND COFACTOR

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=> dup rem 12
PROCESSING COMPLETED FOR L2
L3          15 DUP REM L2 (23 DUPLICATES REMOVED)
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=> d 1-10

L3 ANSWER 1 OF 15 SCISEARCH COPYRIGHT 2003 ISI (R) DUPLICATE 1  
AN 2001:182142 SCISEARCH  
GA The Genuine Article (R) Number: 402XU  
TI Continuous enzymatic regeneration of redox mediators used in  
biotransformation reactions employing flavoproteins  
AU Bäminger U; Ludwig R; Galhaup C; Leitner C; **Kulbe K D**; Haltrich  
D (Reprint)  
CS Agr Univ Vienna, Inst Food Technol, Div Biochem Engn, Muthgasse 18, A-1190  
Vienna, Austria (Reprint); Agr Univ Vienna, Inst Food Technol, Div Biochem  
Engn, A-1190 Vienna, Austria  
CYA Austria  
SO JOURNAL OF MOLECULAR CATALYSIS B-ENZYMATIC, (22 JAN 2001) Vol. 11, No.  
4-6, Sp. iss. SI, pp. 541-550.  
Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM,  
NETHERLANDS.  
ISSN: 1381-1177.  
DT Article; Journal  
LA English  
REC Reference Count: 30  
\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L3 ANSWER 2 OF 15 MEDLINE DUPLICATE 2  
AN 1998149716 MEDLINE  
DN 98149716 PubMed ID: 9490072  
TI A multistep process is responsible for product-induced inactivation of  
glucose-fructose oxidoreductase from *Zymomonas mobilis*.  
AU Furlinger M; Haltrich D; **Kulbe K D**; Nidetzky B  
CS Division of Biochemical Engineering, Institute of Food Technology,  
Universitat fur Bodenkultur Wien (BOKU), Vienna, Austria.  
SO EUROPEAN JOURNAL OF BIOCHEMISTRY, (1998 Feb 1) 251 (3) 955-63.  
Journal code: 0107600. ISSN: 0014-2956.  
CY GERMANY: Germany, Federal Republic of  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 199803  
ED Entered STN: 19980407  
Last Updated on STN: 19980407  
Entered Medline: 19980323

L3 ANSWER 3 OF 15 MEDLINE DUPLICATE 3  
AN 97439719 MEDLINE  
DN 97439719 PubMed ID: 9307027  
TI alpha-1,4-D-glucan phosphorylase of gram-positive *Corynebacterium*  
callunae: isolation, biochemical properties and molecular shape of the  
enzyme from solution X-ray scattering.  
AU Weinhäusel A; Griessler R; Krebs A; Zipper P; Haltrich D; **Kulbe K**  
D; Nidetzky B  
CS Division of Biochemical Engineering, Institute of Food Technology,  
Universitat fur Bodenkultur (BOKU), Muthgasse 18, A-1190 Vienna, Austria.  
SO BIOCHEMICAL JOURNAL, (1997 Sep 15) 326 ( Pt 3) 773-83.  
Journal code: 2984726R. ISSN: 0264-6021.  
CY ENGLAND: United Kingdom  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 199710  
ED Entered STN: 19971024  
Last Updated on STN: 19980206  
Entered Medline: 19971016

L3 ANSWER 4 OF 15 HCAPLUS COPYRIGHT 2003 ACS  
AN 1996:48612 HCAPLUS  
DN 124:110966  
TI Carry out coenzyme conversions economically  
AU Nidetzky, Bernd; Haltrich, Dietmar; **Kulbe, Klaus D.**  
CS Inst. Food Technology, Univ. Agriculture, Vienna, Austria  
SO CHEMTECH (1996), 26(1), 31-6

PB CODEN: CHTEDD; ISSN: 0009-2703

DT American Chemical Society

LA Journal

English

L3 ANSWER 5 OF 15 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI  
AN 1992-09449 BIOTECHDS  
TI Cofactor regeneration in continuous enzymatic synthesis;  
coenzyme regeneration in charged ultrafiltration membrane enzyme  
reactor (conference paper)  
AU Kulbe K D  
LO Fraunhofer-Institut fuer Grenzflaechen- und Bioverfahrenstechnik,  
Nobelstrasse 12, D-W 7000 Stuttgart 80, Germany.  
SO Biochem. Eng. Stuttgart; (1991) 18-25  
DT Journal  
LA English

L3 ANSWER 6 OF 15 HCPLUS COPYRIGHT 2003 ACS  
AN 1992:104336 HCPLUS  
DN 116:104336  
TI Cofactor regeneration in continuous enzymic synthesis  
AU Kulbe, K. D.  
CS Fraunhofer-Inst. Grenzflaechen- Bioverfahrenstech., Stuttgart, D-W  
7000/80, Germany  
SO Biochem. Eng.--Stuttgart, [Proc. Int. Symp.], 2nd (1991), Meeting Date  
1990, 18-25. Editor(s): Reuss, Matthias. Publisher: Fischer, Stuttgart,  
Fed. Rep. Ger.  
CODEN: 57KIAI  
DT Conference; General Review  
LA English

L3 ANSWER 7 OF 15 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI  
AN 1990-08991 BIOTECHDS  
TI Continuous coenzyme dependent stereoselective synthesis of sulcatol by  
alcohol-dehydrogenase;  
from *Thermoanaerobium brockii*; stereospecific pheromone production;  
NADP coenzyme regeneration; potential large-scale hydrophobic fine  
chemical production  
AU Roethig T R; Kulbe K D; Bueckmann F; Carrea G  
LO Fraunhofer-Institut fuer Grenzflaechen- und Bioverfahrenstechnik,  
Nobelstrasse 12, D-7000 Stuttgart 80, Germany.  
SO Biotechnol. Lett.; (1990) 12, 5, 353-56  
CODEN: BILED3  
DT Journal  
LA English

L3 ANSWER 8 OF 15 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI  
AN 1992-00939 BIOTECHDS  
TI Simultaneous synthesis of sorbitol and gluconic acid by  
glucose-fructose-oxidoreductase;  
and gluconolactonase; purification from *Zymomonas mobilis* (conference  
paper)  
AU Haug I; Heinzler A; Kulbe K D  
LO Fraunhofer-Institut fuer Grenzflaechen- und Bioverfahrenstechnik,  
Nobelstrasse 12, D-7000 Stuttgart-80, Germany.  
SO DECHEMA Biotechnol. Conf.; (1990) 4, Pt.A, 289-92  
DT Journal  
LA English

L3 ANSWER 9 OF 15 SCISEARCH COPYRIGHT 2003 ISI (R) DUPLICATE 5  
AN 91:96438 SCISEARCH  
GA The Genuine Article (R) Number: EX282  
TI A CONTINUOUS ENZYME MEMBRANE REACTOR RETAINING THE NATIVE NICOTINAMIDE  
COFACTOR NAD(H)  
AU HOWALDT M W (Reprint); KULBE K D; CHMIEL H  
CS CALTECH, DEPT CHEM ENGN, PASADENA, CA, 91125; FRAUNHOFER INST GRENZFLACHEN  
& BIOVERFAHRENSTECH, W-7000 STUTTGART, GERMANY  
CYA USA; GERMANY  
SO ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, (1990) Vol. 589, No. MAY, pp.

253-260.

DT Article; Journal

LA ENGLISH

REC Reference Count: 10

L3 ANSWER 10 OF 15 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI

AN 1992-01080 BIOTECHDS

TI Modelling of kinetics of alcohol-dehydrogenase from *Thermoanaerobium brockii* with continuous **cofactor** regeneration;

NADPH coenzyme regeneration by the coupled substrate approach;

S-sulcatol pheromone production (conference paper)

AU Roethig T R; Schmidt K; Chmiel H; **Kulbe K D**

LO Fraunhofer-Institut fuer Grenzflaechen- und Bioverfahrenstechnik,  
Nobelstr. 12, D-7000 Stuttgart 80, Germany.

SO DECHEMA Biotechnol. Conf.; (1990) 4, Pt.A, 155-158

DT Journal

LA English

=> d 4-6 ab

L3 ANSWER 4 OF 15 HCPLUS COPYRIGHT 2003 ACS

AB A method for coenzyme retention in continuous NAD(P)H-dependent synthesis is presented. A charged nanofiltration membrane that has a well-defined size exclusion slightly higher than the mol. mass of the **cofactor** is used to keep the coenzyme in the reactor, allowing efficient regeneration. In addn., because the membrane has acidic functional groups and NADH and NADPH are amphoteric mols. carrying a neg. net charge at pH values higher than 3, the electrostatic repulsion can be exploited for coenzyme retention. In an ideal situation, both the enzymes and the coenzymes are retained completely with the products and nonreacted substrates permeating freely. The technol. is demonstrated for prodn. of xylitol and mannitol.

L3 ANSWER 5 OF 15 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI

AB Some results of studies on continuous **cofactor** (coenzyme) regeneration were presented. The enzymatic synthesis of mannitol (or sorbitol) and gluconic acid from glucose-fructose mixtures was studied in a 70 ml charged ultrafiltration membrane enzyme reactor (ChUFER). At this scale, rejection coefficients for NADH of over 99% and cycle numbers of over 150,000 were achieved. The latter figure may reach over 500,000 by increasing enzyme concentrations. NADP(H) retention coefficients of over 99.9% were measured; coenzyme costs were therefore no longer an economical problem. This approach was applicable to the synthesis of sorbitol, xylitol, maltitol and some aromatic alcohols by using unspecific NAD(P)H-dependent aldose-reductase (EC-1.1.1.21) enzymes from *Candida* sp. The ChUFER concept was also suitable in some NADP-dependent steroid transformations. The ChUFER works well even in the presence of organic solvents. The ChUFER concept of coenzyme regeneration allows the use of all enzymes with their native coenzymes; there are no problems with immobilization yields and neither a decrease of Vmax nor an increase of Km can occur. (30 ref)

L3 ANSWER 6 OF 15 HCPLUS COPYRIGHT 2003 ACS

AB A review with 30 refs., mainly of the author's work on NADP-dependent carbohydrate transformations.

=> d 9 ab

L3 ANSWER 9 OF 15 SCISEARCH COPYRIGHT 2003 ISI (R) DUPLICATE 5

=> d 11-15

L3 ANSWER 11 OF 15 HCPLUS COPYRIGHT 2003 ACS

AN 1991:447678 HCPLUS

DN 115:47678

TI Modeling of kinetics of alcohol dehydrogenase from *Thermoanaerobium*

AU. brockii with continuous **cofactor** regeneration  
AU. Roethig, T. R.; Schmidt, K.; Chmiel, H.; **Kulbe, K. D.**  
CS. Fraunhofer-Inst. Grenzflaechen- Bioverfahrenstech., Stuttgart, D-7000/80,  
Germany  
SO. DECHEMA Biotechnology Conferences (1990), 4(Pt. A, Lect. DECHEMA Annu.  
Meet. Biotechnol., 8th, 1990), 155-8  
CODEN: DBCOEU; ISSN: 0934-3792  
DT. Journal  
LA. English

L3. ANSWER 12 OF 15 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI  
AN. 1991-03231 BIOTECHDS  
TI. Charged membrane enzyme reactors for continuous regeneration of native  
coenzymes. II. Synthesis of hydrophobic compounds with NADP(H) dependent  
dehydrogenases;

S-sulcatol production by alcohol-dehydrogenase; 12-keto-cheno-  
deoxycholic acid production by 12-alpha-hydroxysteroid-dehydrogenase;  
NADPH coenzyme regeneration (conference paper)

AU. Roethig T R; Schmidt K; Chmiel H; Hasenfratz H; **Kulbe K D**  
LO. Fraunhofer-Institut fuer Grenzflaechen- und Bioverfahrenstechnik,  
Nobelstrasse 12, D-7000 Stuttgart 80, Germany.  
SO. DECHEMA Biotechnol. Conf.; (1989) 3, Pt.B, 643-47  
DT. Journal  
LA. English

L3. ANSWER 13 OF 15 HCAPLUS COPYRIGHT 2003 ACS  
AN. 1989:422086 HCAPLUS  
DN. 111:22086  
TI. Simultaneous conversion of glucose/fructose mixtures in a membrane reactor  
AU. Howaldt, Michael; Gottlob, Axel; **Kulbe, Klaus D.**; Chmiel, Horst  
CS. Fraunhofer Inst. Grenzflaechen- und Bioverfahrenstech., Stuttgart, D-7000,  
Fed. Rep. Ger.  
SO. Annals of the New York Academy of Sciences (1988), 542(Enzyme Eng. 9),  
400-5  
CODEN: ANYAA9; ISSN: 0077-8923  
DT. Journal  
LA. English

L3. ANSWER 14 OF 15 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI  
AN. 1989-05574 BIOTECHDS  
TI. Optimization of reactor performance for coenzyme dependent enzyme  
reactions: computer simulation and experiments;  
coenzyme regeneration for glucose-dehydrogenase and  
mannitol-dehydrogenase in continuous stirred tank reactor and plug  
flow reactor (conference abstract)  
AU. Howaldt M W; Chmiel H; **Kulbe K D**  
LO. Fraunhofer-Institut fuer Grenzflaechen - und Bioverfahrenstechnik,  
Nobelstrasse 12, 7000 Stuttgart 80, Germany.  
SO. Eur.Congr.Biotechnol.; (1987) Vol.1, 257  
DT. Journal  
LA. English

L3. ANSWER 15 OF 15 HCAPLUS COPYRIGHT 2003 ACS  
AN. 1987:137030 HCAPLUS  
DN. 106:137030  
TI. Intrasequential **cofactor** regeneration in enzymatic synthesis,  
particularly when producing vitamin C  
IN. **Kulbe, Klaus D.**; Knopki, Gisela  
PA. Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung e.V.,  
Fed. Rep. Ger.  
SO. PCT Int. Appl., 48 pp.  
CODEN: PIXXD2  
DT. Patent  
LA. German  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 8604353	A1	19860731	WO 1986-EP24	19860122
	W: JP, US				

RW: AT, BE, CH, DE, [REDACTED] GB, IT, LU, NL, SE  
DE 3502141 A1 19861016 DE 1985-3502141 19850123  
DE 3502141 C2 19910829  
EP 209583 A1 19870128 EP 1986-901053 19860122  
R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE  
JP 62501747 T2 19870716 JP 1986-500910 19860122  
PRAI DE 1985-3502141 19850123  
WO 1986-EP24 19860122

=> s chufert  
L4 2 CHUFER

=> d1,2

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"HELP COMMANDS" at an arrow prompt (=>).

=> d 1,2

L4 ANSWER 1 OF 2 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI  
AN 1994-09980 BIOTECHDS  
TI Continuous synthesis of xylitol by NAD(P)H-linked aldose-reductase in a  
charged ultrafiltration membrane-enzyme reactor;  
xylitol production from xylose using *Candida tenuis* enzyme, with  
coenzyme regeneration using e.g. *Candida boidinii* formate-  
dehydrogenase (conference paper)  
AU Kulbe K D; Schmidt H; Scholze H A  
CS Univ.Vienna-Agr.; Fraunhofer-Inst.  
LO Division of Biochemical Engineering, Institute of Food Technology,  
Universitaet fuer Bodenkultur Wien, Peter Jordan-Strasse 82, A-1190 Wien,  
Austria.  
SO Prog.Biotechnol.; (1992) 7, 565-72  
CODEN: PBITE3  
DT Journal  
LA English

L4 ANSWER 2 OF 2 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI  
AN 1992-09449 BIOTECHDS  
TI Cofactor regeneration in continuous enzymatic synthesis;  
coenzyme regeneration in charged ultrafiltration membrane enzyme  
reactor (conference paper)  
AU Kulbe K D  
LO Fraunhofer-Institut fuer Grenzflaechen- und Bioverfahrenstechnik,  
Nobelstrasse 12, D-W 7000 Stuttgart 80, Germany.  
SO Biochem.Eng.Stuttgart; (1991) 18-25  
DT Journal  
LA English

=> d 1, 2 ab

L4 ANSWER 1 OF 2 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI  
AB A continuous process for the enzymatic production of xylitol from xylose  
was reported to be under development. The NAD(P)H-linked  
aldose-reductase (ALR, EC-1.1.1.21) from *Candida tenuis* CBS 4435 was  
purified to a specific activity of 32 U/mg by salt precipitation and  
chromatography on phenyl-Sepharose, Q-Sepharose and Mono-Q. The enzyme  
was purified 25-fold and was obtained in 15% yield. The enzyme showed  
optimal activity at pH 6.5-7.0 and 50 deg. The half-life was 22 days at  
23 deg. The mol.wt. was 41,000 (gel filtration) and the pI was 4.70. Km  
values were 227-228 mM for xylose, 0.021-0.0236 for NADPH and 0.060-0.078  
mM for NADH. For coenzyme regeneration, formate-dehydrogenase  
(EC-1.2.1.2) from *Candida boidinii* could be used. A charge  
ultrafiltration membrane-enzyme reactor (ChUFER) was developed  
that allowed the retention and continuous regeneration of free NAD(P)H.  
For simultaneous production of glucuronic acid and mannitol, more than  
150,000 coenzyme regeneration cycles were possible. Xylitol was produced

by linking xylose reduction to oxidation of formic acid     ucose or even  
xylose in the ChUFER. (18 ref)

L4      ANSWER 2 OF 2 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT AND ISI  
AB.      Some results of studies on continuous cofactor (coenzyme) regeneration  
were presented. The enzymatic synthesis of mannitol (or sorbitol) and  
gluconic acid from glucose-fructose mixtures was studied in a 70 ml  
charged ultrafiltration membrane enzyme reactor (ChUFER). At  
this scale, rejection coefficients for NADH of over 99% and cycle numbers  
of over 150,000 were achieved. The latter figure may reach over 500,000  
by increasing enzyme concentrations. NADP(H) retention coefficients of  
over 99.9% were measured; coenzyme costs were therefore no longer an  
economical problem. This approach was applicable to the synthesis of  
sorbitol, xylitol, maltitol and some aromatic alcohols by using  
unspecific NAD(P)H-dependent aldose-reductase (EC-1.1.1.21) enzymes from  
Candida sp. The ChUFER concept was also suitable in some  
NADP-dependent steroid transformations. The ChUFER works well  
even in the presence of organic solvents. The ChUFER concept  
of coenzyme regeneration allows the use of all enzymes with their native  
coenzymes; there are no problems with immobilization yields and neither a  
decrease of Vmax nor an increase of Km can occur. (30 ref)

=> dis his

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NTIS, ESBIOBASE, BIOTECHNO, WPIDS' ENTERED AT 14:46:33 ON 22 JAN 2003

L1      962 S KULBE, ?/AU  
L2      38 S L1 AND COFACTOR  
L3      15 DUP REM L2 (23 DUPLICATES REMOVED)  
L4      2 S CHUFER

=> log h

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NEWS 9 Jun 03 New e-mail delivery for search results now available  
NEWS 10 Jun 10 MEDLINE Reload  
NEWS 11 Jun 10 PCTFULL has been reloaded  
NEWS 12 Jul 02 FOREGE no longer contains STANDARDS file segment  
NEWS 13 Jul 22 USAN to be reloaded July 28, 2002;  
saved answer sets no longer valid  
NEWS 14 Jul 29 Enhanced polymer searching in REGISTRY  
NEWS 15 Jul 30 NETFIRST to be removed from STN  
NEWS 16 Aug 08 CANCERLIT reload  
NEWS 17 Aug 08 PHARMAMarketLetter(PHARMAML) - new on STN  
NEWS 18 Aug 08 NTIS has been reloaded and enhanced  
NEWS 19 Aug 19 Aquatic Toxicity Information Retrieval (AQUIRE)  
now available on STN  
NEWS 20 Aug 19 IFIPAT, IFICDB, and IFIUDB have been reloaded  
NEWS 21 Aug 19 The MEDLINE file segment of TOXCENTER has been reloaded  
NEWS 22 Aug 26 Sequence searching in REGISTRY enhanced  
NEWS 23 Sep 03 JAPIO has been reloaded and enhanced  
NEWS 24 Sep 16 Experimental properties added to the REGISTRY file  
NEWS 25 Sep 16 CA Section Thesaurus available in CAPLUS and CA  
NEWS 26 Oct 01 CASREACT Enriched with Reactions from 1907 to 1985  
NEWS 27 Oct 21 EVENTLINE has been reloaded  
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NEWS 29 Oct 24 Nutraceuticals International (NUTRACEUT) now available on STN  
NEWS 30 Oct 25 MEDLINE SDI run of October 8, 2002  
NEWS 31 Nov 18 DKILIT has been renamed APOLLIT  
NEWS 32 Nov 25 More calculated properties added to REGISTRY  
NEWS 33 Dec 02 TIBKAT will be removed from STN  
NEWS 34 Dec 04 CSA files on STN  
NEWS 35 Dec 17 PCTFULL now covers WP/PCT Applications from 1978 to date  
NEWS 36 Dec 17 TOXCENTER enhanced with additional content  
NEWS 37 Dec 17 Adis Clinical Trials Insight now available on STN  
NEWS 38 Dec 30 ISMEC no longer available  
NEWS 39 Jan 13 Indexing added to some pre-1967 records in CA/CAPLUS  
NEWS 40 Jan 21 NUTRACEUT offering one free connect hour in February 2003  
NEWS 41 Jan 21 PHARMAML offering one free connect hour in February 2003

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CURRENT MACINTOSH VERSION IS V6.0b(ENG) AND V6.0Jb(JP),  
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